Launch Vehicle

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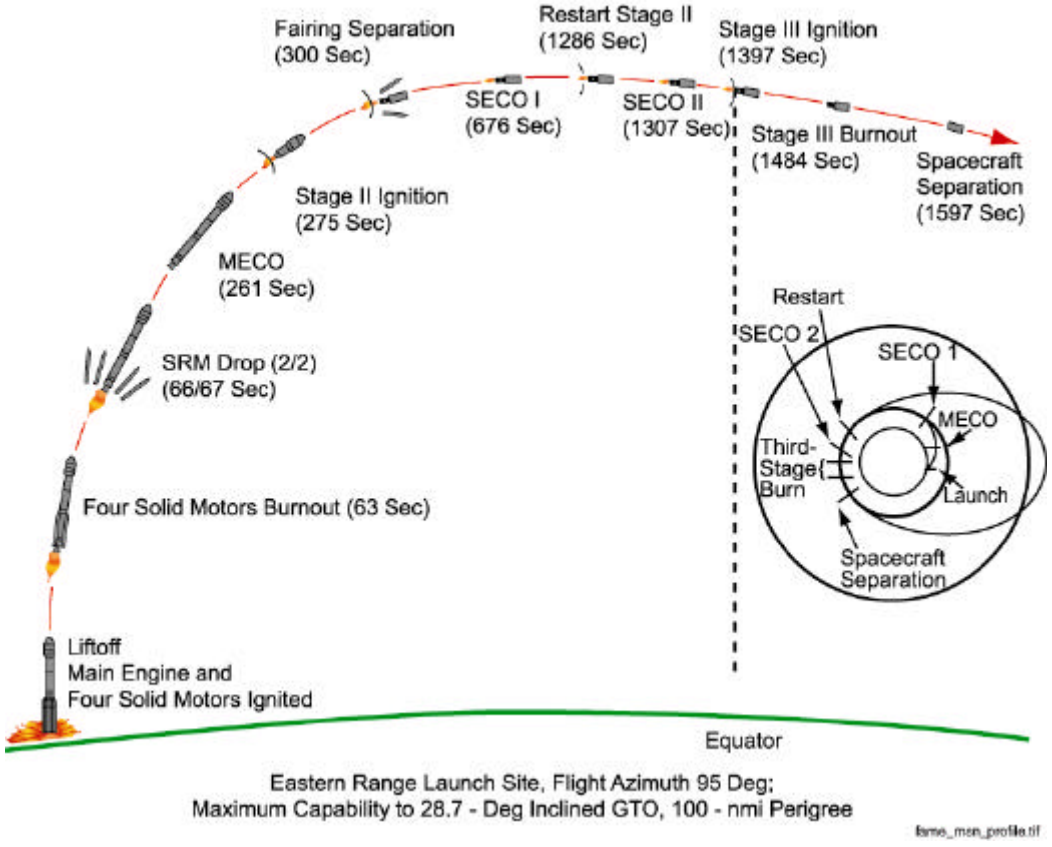
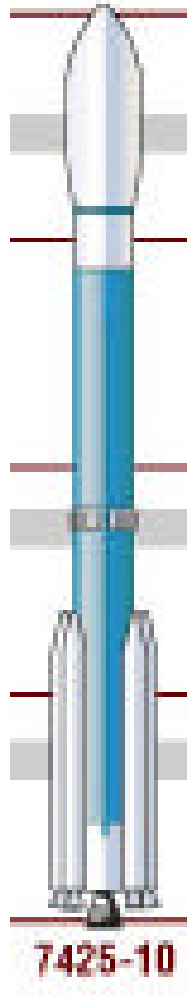
Current Baseline/Approach

- **Boeing Delta II 7425-10**
  - **3m/10’ Dia. Composite Fairing**
  - **29.1’ in Length**
  - **1st Stage - Rocketdyne RS-27A Main Engine Along With 4 GEM Solid Rocket Strap-ons**
  - **2nd Stage - Aerojet AJ10-118K**
  - **3rd Stage - Star 48 SRM**

Mission Profile and Performance Capability

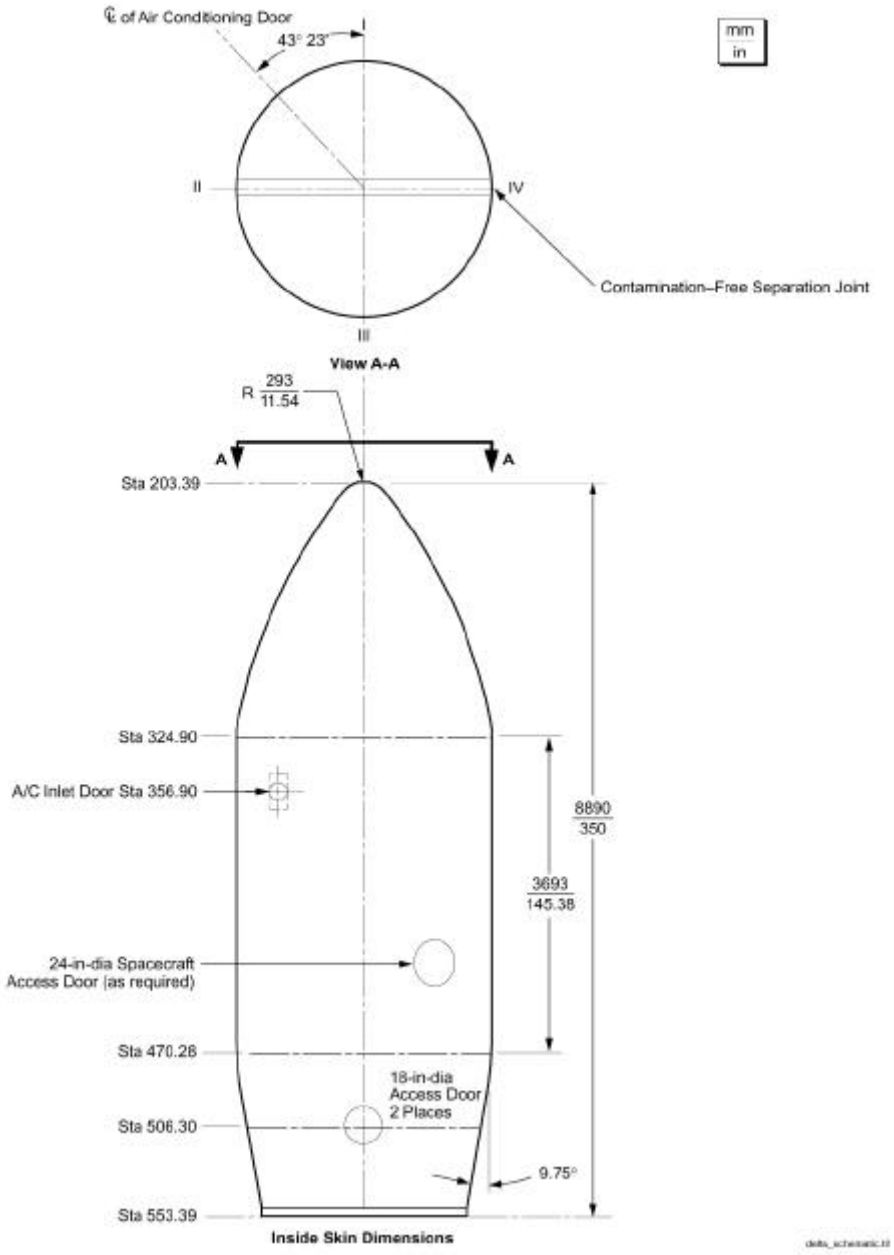
- Inclination = 28.7 Degrees
- Mass = 1102 kg/2430 lb
  - Current FAME Mass = 1031kg
  - LV Margin = 71kg
- Orbit = GTO 185 x 36086km
- Boeing Is Off-Loading Star 48 Third Stage by 241kg





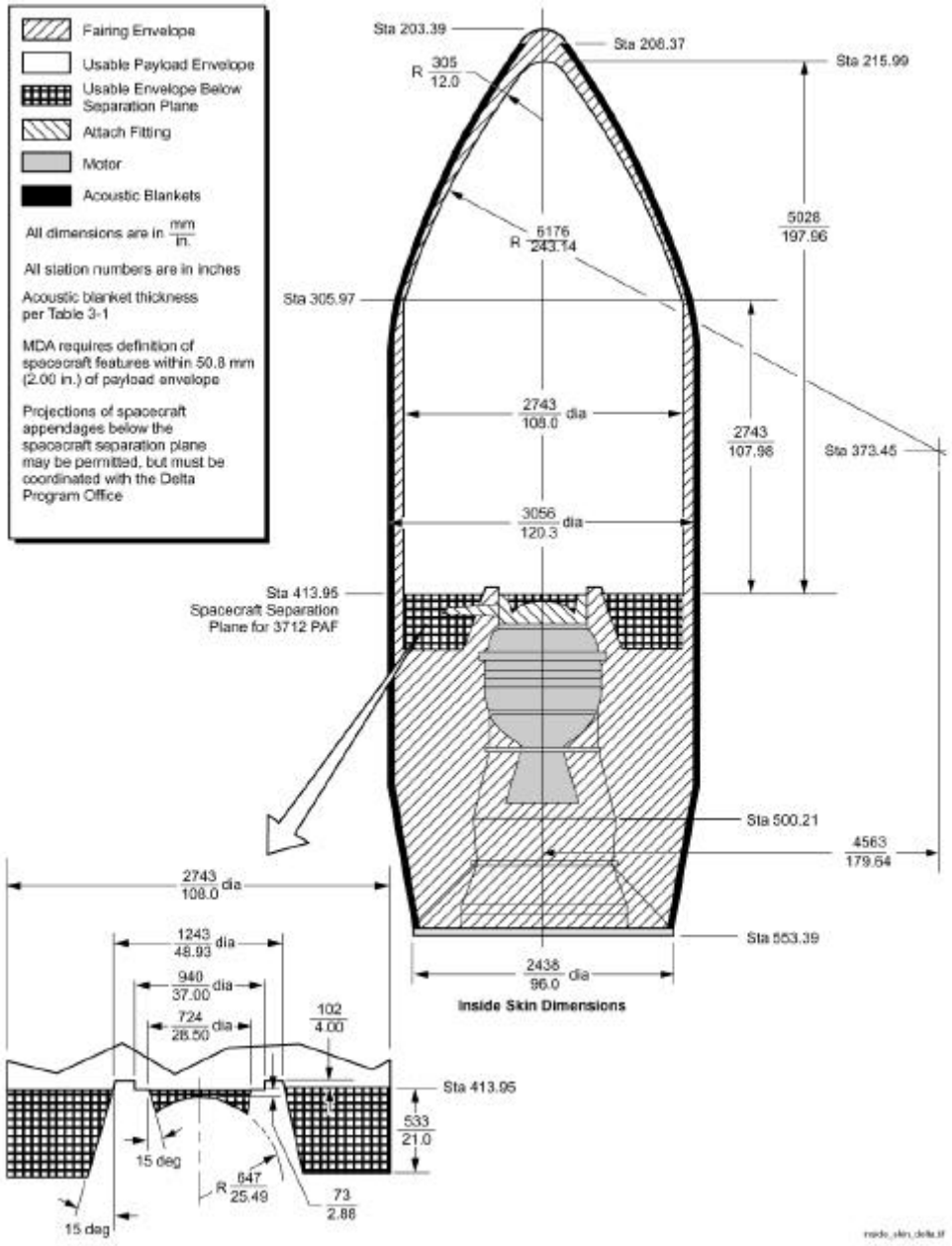
Payload Accommodations and Major Interfaces (1 of 6)

- 3m/10’ Dia. Composite PLF
  - 3” Acoustic Blankets From Boattail to Sta. 213.42 in Nose Section
  - 2 Standard 18” Dia. Access Doors for Second-stage Access
  - 2 Standard 24” Dia. Doors for S/C Access Part of Baseline Service
  - 1 Standard A/C Inlet Door



Payload Accommodations and Major Interfaces (2 of 6)

- **10’ PLF Envelope**



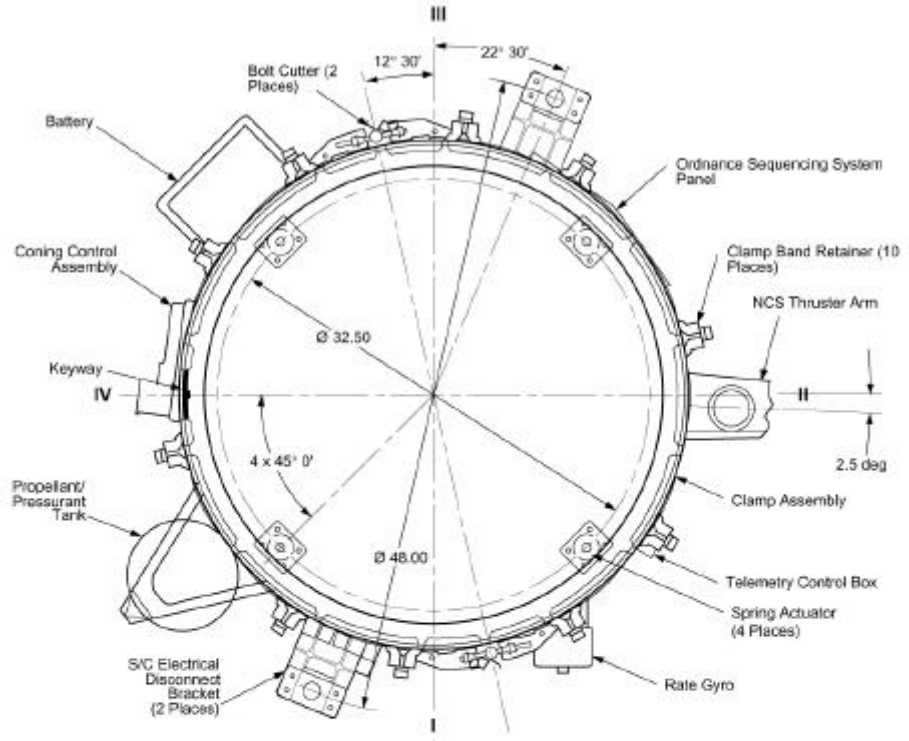
Payload Accommodations and Major Interfaces (3 of 6)

- 3712B Payload Attach Fitting (PAF)
  - Flight Preload = 5700 lb
  - S/C PAF Flange Angle = 20 Degrees

PAF_assy.tif

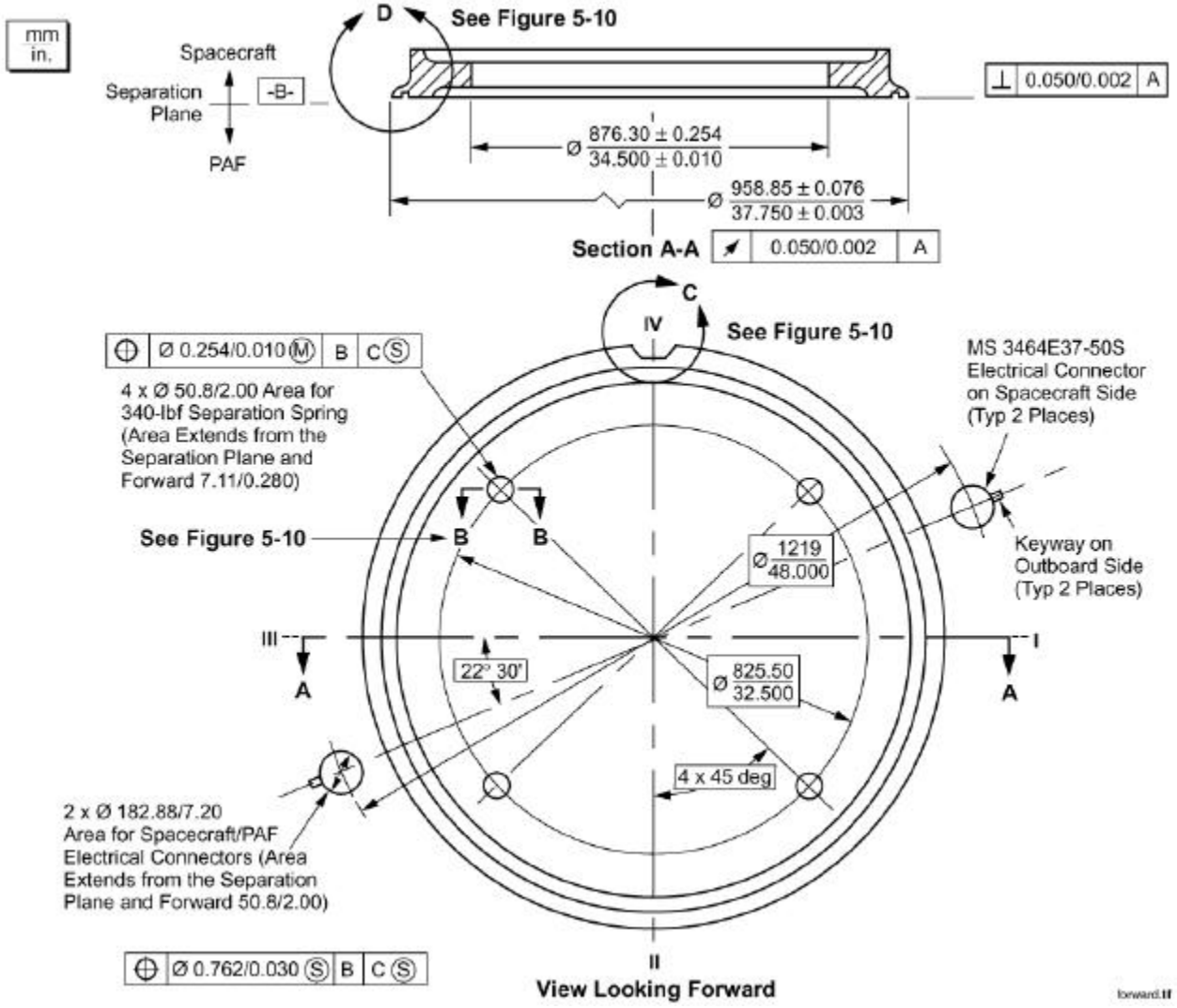
Payload Accommodations and Major Interfaces (4 of 6)

- **3712B PAF Detailed Assembly**



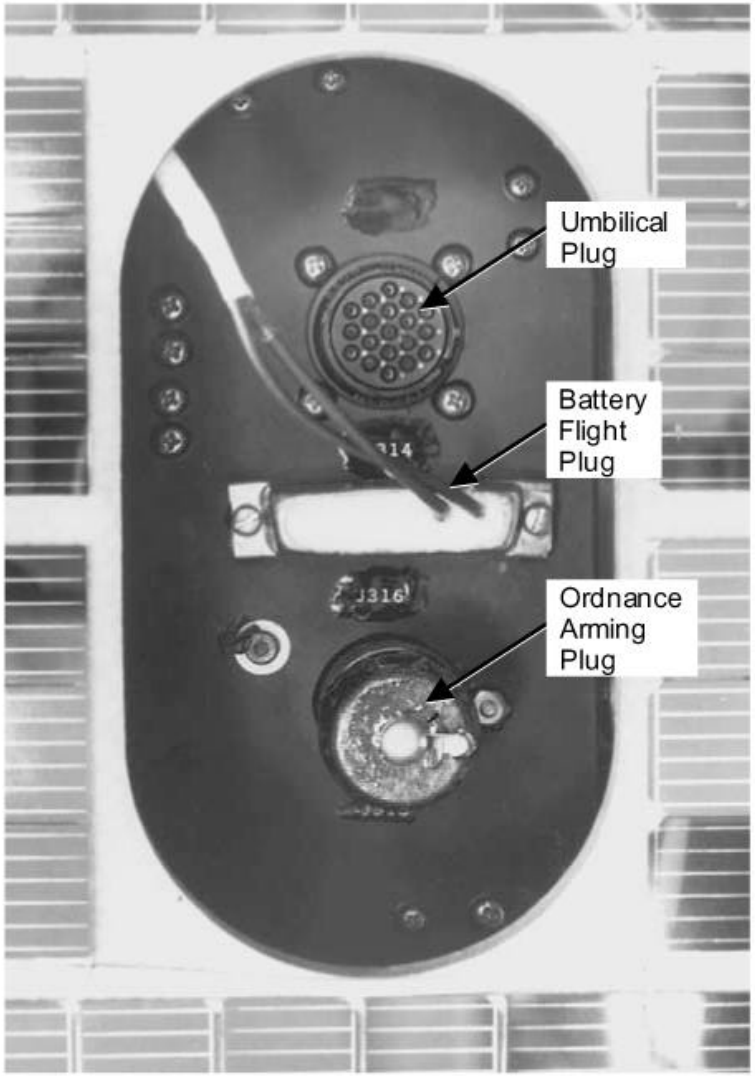
Payload Accommodations and Major Interfaces (5 of 6)

- **3712B PAF Interface Dimensions (More Detail Can Be Provided)**



Payload Accommodations and Major Interfaces (6 of 6)

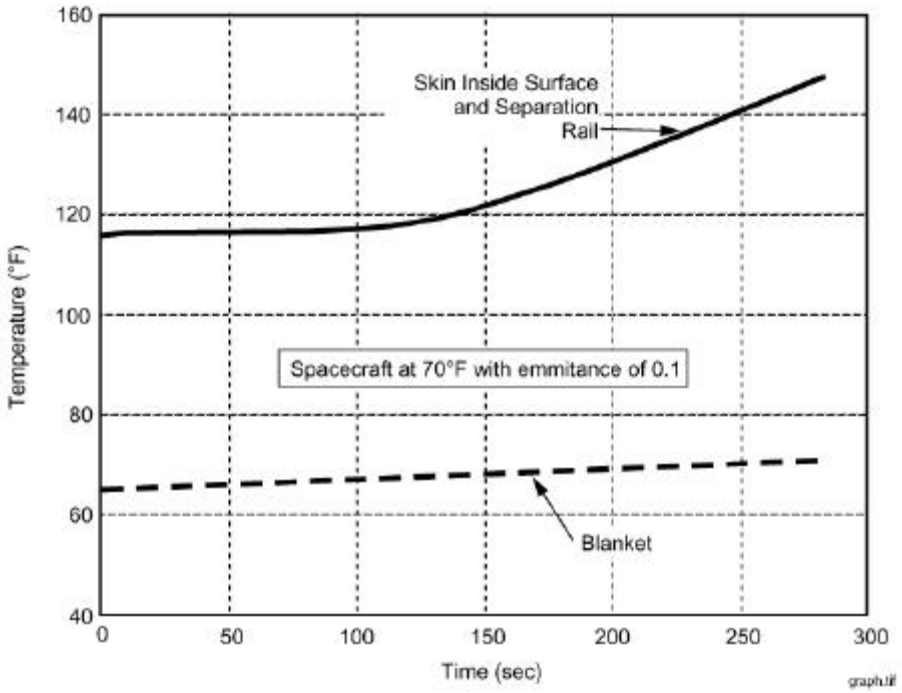
- **Electrical Interfaces**
  - **Two Standard 37-Pin S/C Umbilical Electrical Quick-Disconnect Connectors Located on PAF 180 Degrees Apart**
  - **Option for 61-Pin As Non Standard Service, If Required**
  - **Can Also Have Spacecraft Separation Switch Installed – to Be Coordinated With Delta Program Office**
  - **Standard Console and Blockhouse Provisions**



plug.tif

Environments (1 of 5)

- **Air Conditioning/Humidity/Contamination Control:**
  - **SLC-17:**
    - **Temp = 75 +/- 5 Degrees F**
    - **Humidity = 45 +/- 5%**
    - **Cleanliness = Class 100,000 (FED-STD-209D)**
- **Thermal:**
  - **Fairing Jettisoned at 0.1 Btu/ft^2-sec (1135 W/m^2)**



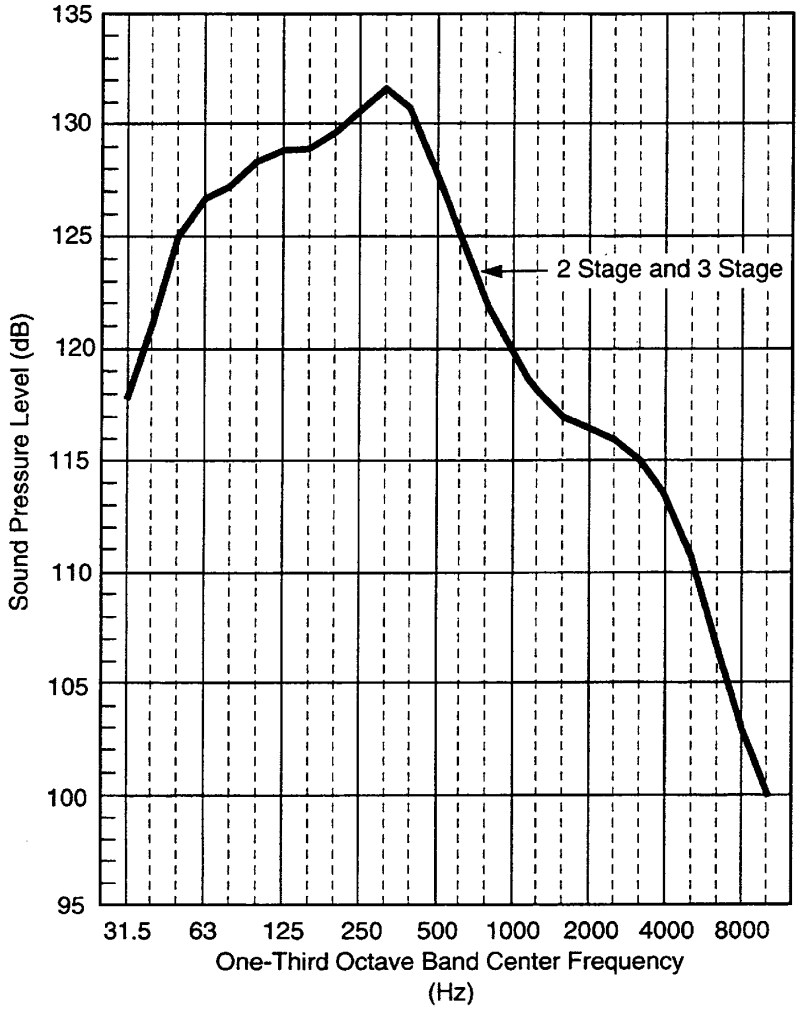
Environments (2 of 5)

- **Loads:**

	Liftoff/Transonic (g)	MECO (g)
Lateral	+/- 2.5, +/- 3.0	+/- 0.1
Axial	+2.8/-0.2	7.6 +/- 0.6

Environments (3 of 5)

- **Acoustics:**
  - **OASPL = 139.9 dB**

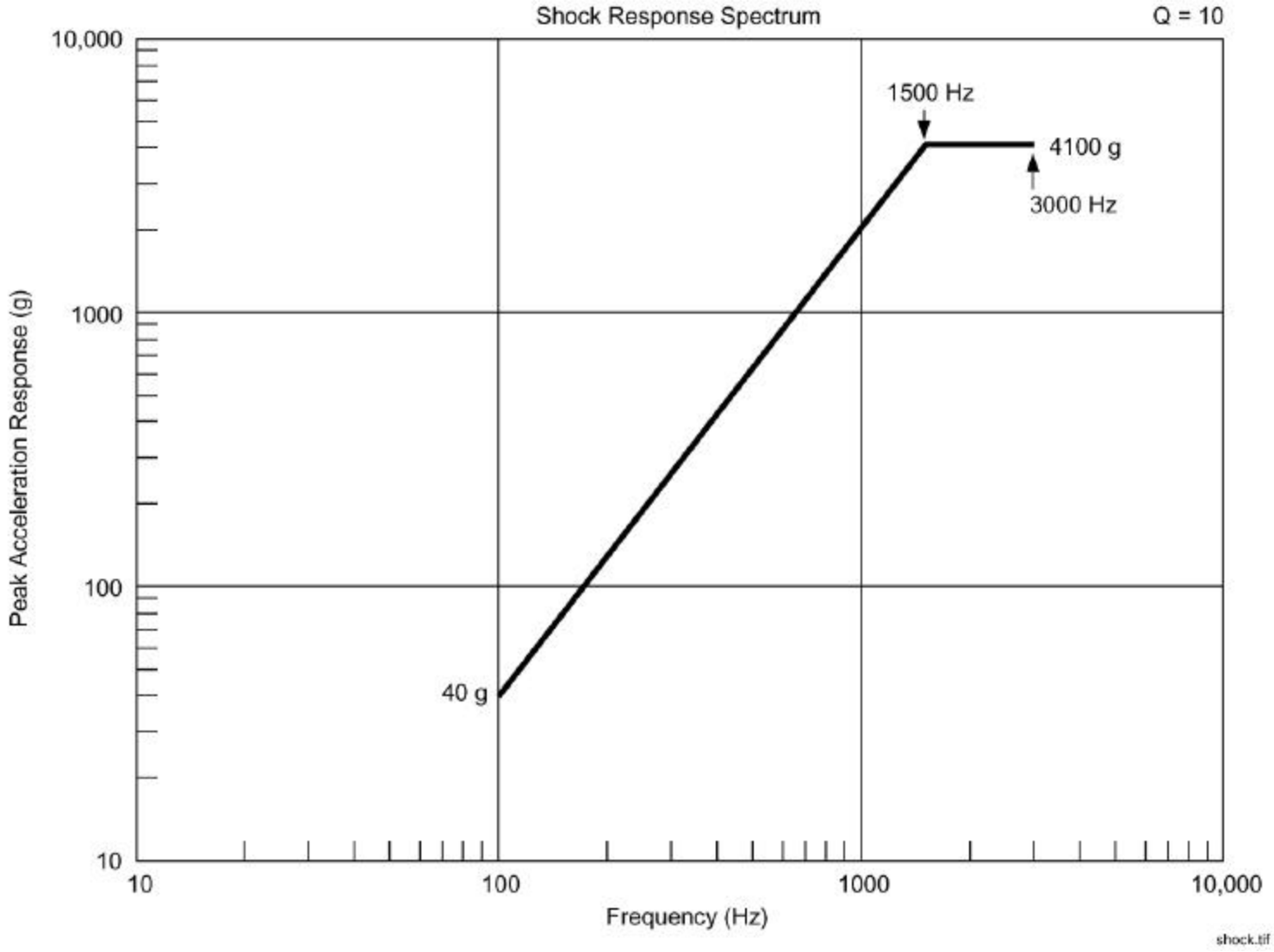


Maxunum Flight Levels (dB)	
One-Third Octave Center Frequency (Hz)	2-Stage and 3-Stage Mission
31.5	117.9
40	121
50	125
63	126.6
80	127.2
100	128.3
125	128.8
160	128.9
200	129.5
250	130.6
315	131.6
400	130.7
500	128
630	125
800	122
1000	120
1250	118
1600	117
2000	116.5
2500	116
3150	115
4000	113.5
5000	111
6300	107
8000	103
10,000	100
OASPL	139.9
Duration	10 seconds

predicted_delta.tif

Environments (4 of 5)

- **Shock:**



Environments (5 of 5)

- **Sinusoidal Vibration:**

Axis	Frequency (Hz)	Maximum flight levels
Thrust	5 to 6.2	1.27 cm (0.5 inch) double amplitude
	6.2 to 100	1.0 g (zero to peak)
Lateral	5 to 100	0.7 g (zero to peak)

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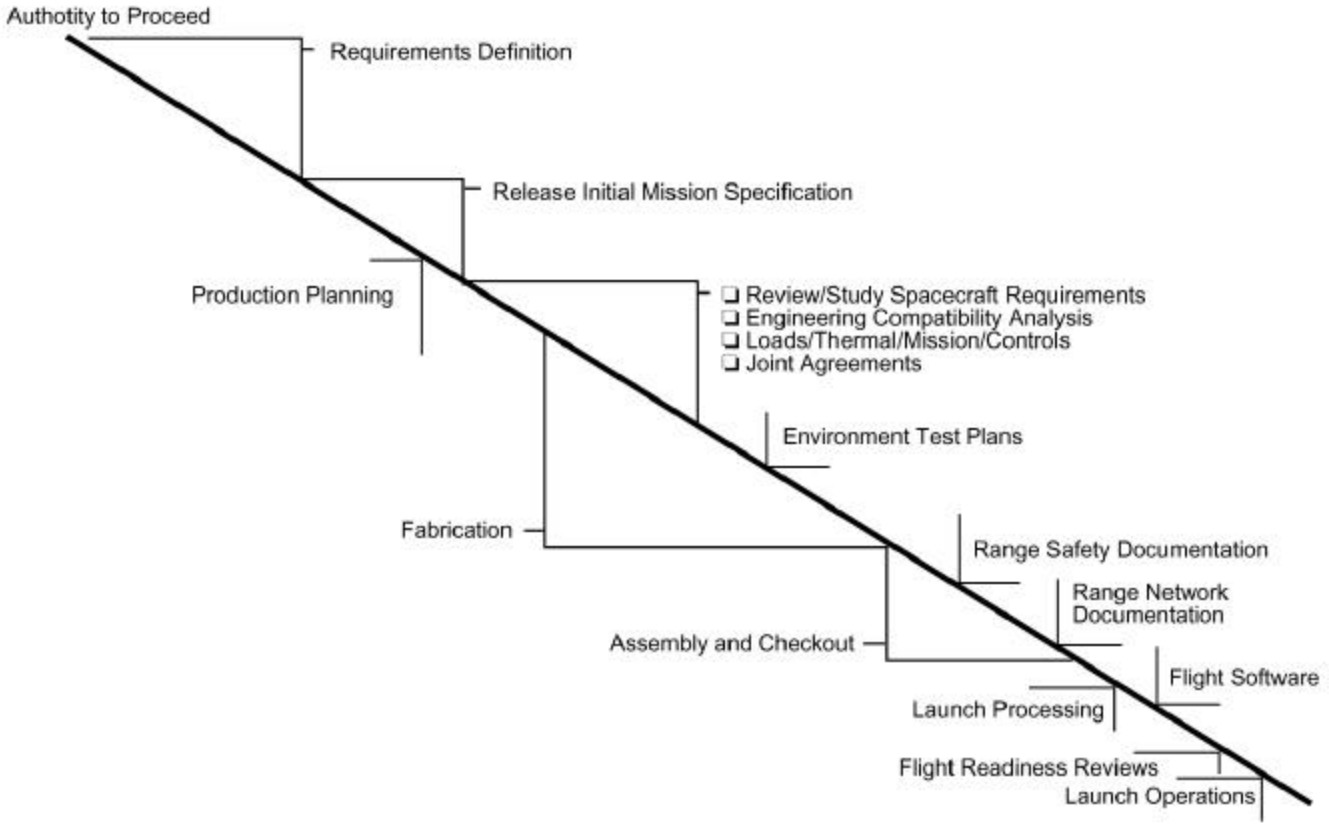
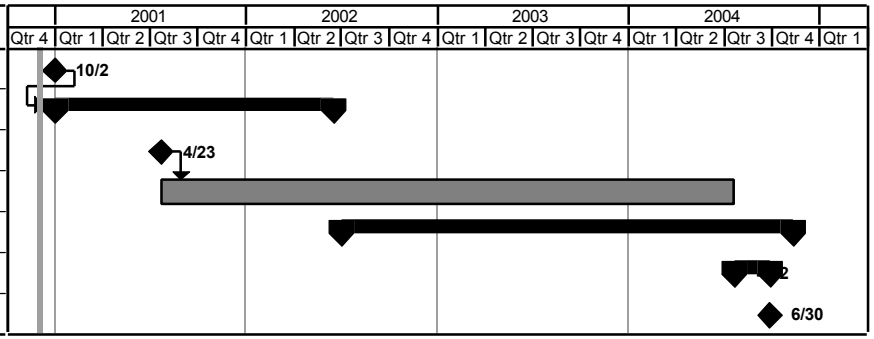
Integration Process

- Typical Delta II Integration Process Is 24 Months
- Sometimes Start Early As L-27 or L-36 Months, Depending on Mission
- Encompasses the Entire Life of LV/Spacecraft Integration Activities
  - Requires Series of Documents, Analyses, Reports, and Meetings
  - Formal Data Exchange Between S/C Agency, NASA, and Boeing



Launch Vehicle Integration and S/C Processing Schedule

ID	Task Name	Duration	Start	Finish
1	Launch Vehicle Integration Initiation	1 day	Mon 10/2/00	Mon 10/2/00
2	**Advance Payload Support-As Req'd**	**380 days**	**Tue 10/3/00**	**Mon 3/18/02**
13	Launch Vehicle ATP	1 day	Mon 4/23/01	Mon 4/23/01
14	Rqmts. Defn., ICD, Mission Int. Meetings	784 days	Tue 4/24/01	Fri 4/23/04
15	**Required Documentation and Activities**	**616 days**	**Thu 4/4/02**	**Thu 8/12/04**
41	**Launch Site Processing**	**49.5 days**	**Thu 4/22/04**	**Wed 6/30/04**
54	Launch	1 day	Wed 6/30/04	Wed 6/30/04



Potential Trades

- Look Into Using a 7920-10 , Delta II 2-Stage Vehicle
  - 1200kg Capability

Issues

- **No LV Issues at This Time**